

APPENDIX F

AIR QUALITY REPORT

Creekview Specific Plan Air Quality and Greenhouse Gas Technical Report

Prepared for:
City of Roseville
Planning & Redevelopment
311 Vernon Street
Roseville, CA 95678
Contact: Kathy Pease
Phone: (916) 774-5434

Prepared by:
Rimpo and Associates, Inc
6097 Garden Towne Way
Orangevale, CA 95662
Contact: Tim Rimpo
Phone: (916) 337-8449

Revised September 22, 2010

Table of Contents

Acronyms Used in this Report	iii
Executive Summary	iv
Project Description.....	1
Environmental Setting	4
Existing Air Quality Conditions	4
Climate and Topography.....	4
Air Pollutants and Ambient Air Quality Standards	4
Sensitive Receptors	10
Greenhouse Gases and Climate Change	10
Regulatory Setting	13
Federal.....	13
State.....	13
Local	14
Greenhouse Gas Emissions and Global Climate Change Regulatory Environment.....	14
Impact Analysis	19
Significance Thresholds	19
Approach and Methodology	19
Impacts and Mitigation Measures of the CSP Proposed Development.....	22
Construction Emissions	22
Operational Emissions	28
Carbon Monoxide Concentrations	31
Toxic Air Contaminants (TACs)	33
Odors.....	36
Greenhouse Gas Emissions	38
References	46
Personal Communication	48

Appendix A (follows page 48)

List of Tables and Figures

Figure 1. Regional Project Location	2
Figure 2. Creekview Specific Plan Land Use Map	3
Table 1. California and National Ambient Air Quality Standards.....	6
Table 2. Sacramento Valley Air Basin State and National Ambient Air Quality Attainment Status	7
Table 3. Ozone Monitoring Results at the Roseville North Sunrise Monitoring Station.....	7
Table 4. Carbon Monoxide Monitoring Results	8
Table 5. Particulate Matter Monitoring Results at the Roseville North Sunrise Monitoring Station	9
Table 6. Buildout Construction Emissions excluding Urban Reserve (unmitigated, pounds per day).....	23
Table 7. Buildout Construction Emissions including Urban Reserve (unmitigated, pounds per day).....	23
Table 8. Buildout Construction Emissions excluding Urban Reserve (mitigated, pound per day)	25
Table 9. Buildout Construction Emissions including Urban Reserve (mitigated, pounds per day).....	26
Table 10. Operational Criteria Pollutant Emissions for Buildout of Specific Plan and Alternatives 2 and 3 (unmitigated, pounds per day)	29
Table 11. Operational Criteria Pollutant Emissions for Buildout of CSP Specific Plan, and Alternatives 2 and 3 (mitigated, pounds per day).....	30
Table 12. Modeled Carbon Monoxide Levels for 2025 Cumulative Plus Project Conditions.....	32
Figure 3. Wind Rose for the CSP Area.....	34
Figure 4. Location of Residential Areas Compared to Potential Sources of TACs and Odors.....	35
Table 13. Operational GHG Emissions for Specific Plan Buildout (unmitigated, metric tons per year) ...	39
Table 14. Operational GHG Emissions for Alternative 2 Buildout (unmitigated, metric tons per year)....	40
Table 15. Operational GHG Emissions for Alternative 3 Buildout (unmitigated, metric tons per year)....	41
Table 16. Operational GHG Emissions for CSP Specific Plan Buildout (mitigated, metric tons per year)....	43
Table 17. Operational GHG Emissions for Alternative 2 (mitigated, metric tons per year).....	44
Table 18. Operational GHG Emissions for Alternative 3 (mitigated, metric tons per year).....	45

Acronyms Used in this Report

AADT – average annual daily trips
AB – (California) Assembly Bill
AG – (California) Attorney General
ARB – (California) Air Resources Board
CAAQS – California Ambient Air Quality Standards
CAL-EPA – California Environmental Protection Agency
CAPCOA – California Air Pollution Control Officers Association
CAT – Climate Action Team
CEC – California Energy Commission
CEQA – California Environmental Quality Act
CO – carbon monoxide
CO₂ – carbon dioxide
CO₂e – carbon dioxide equivalent
CH₄ - methane
EPA – Environmental Protection Agency
GHG – greenhouse gas
GWP – global warming potential
IPCC – Intergovernmental Panel on Climate Change
LCFS – Low Carbon Fuels Standard
LED – light emitting diode
LEED – Leadership in Energy and Environmental Design
LOS – level of service
NAAQS – National Ambient Air Quality Standards
OPR – (California) Office of Planning and Research
N₂O – nitrous oxide
NO_x – oxides of nitrogen
NO₂ – nitrogen dioxide
PCAPCD – Placer County Air Pollution Control District
PM₁₀ – particulate matter 10 microns or less in diameter
PM_{2.5} – particulate matter 2.5 microns or less in diameter
ppm – parts per million
ROG – reactive organic gas
SB – (California) Senate Bill
SO_x – sulfur oxides
SO₂ – sulfur dioxide
SRI – solar reflective index
SVAB – Sacramento Valley Air Basin
CSP – Creekview Specific Plan
TAC – toxic air contaminant

Executive Summary

This report analyzes the air quality and greenhouse gas effects of the Creekview Specific Plan (CSP). The CSP project site is 501 acres of undeveloped land located in unincorporated Placer County, immediately west and south of the City of Roseville's existing City limits (see Figure 1).

The proposed CSP would include development of 2,098 residential units, 27 acres of commercial and office uses, 46 acres of public/quasi-public use, 133 acres of open space uses, and 16 acres of parks (see Figure 2). This scenario is assumed to be built out by 2025. A second scenario includes buildout by 2025 of a 40-acre Urban Reserve area with 405 dwelling units.

This report also analyzes three project alternatives to the 2025 CSP buildout:

- Alternative 1 – no project,
- Alternative 2 – reduced density/same footprint, and
- Alternative 3 –high density/compact development.

Criteria pollutant emissions of reactive organic gases, nitrogen oxides, and particulate matter were estimated for the CSP and compared to the Placer County Air Pollution Control District's (PCAPCD's) significance thresholds. Construction and operation of the CSP would exceed the PCAPCD's thresholds for one or more pollutants. Mitigation measures were identified to reduce construction and operational emissions. Even with mitigation, however, construction and operational emissions would still exceed PCAPCD thresholds.

Carbon monoxide (CO) modeling was conducted to determine whether the project would cause or contribute to violations of either the California or national ambient air quality standards. Neither the proposed CSP nor any of the project alternatives would cause violations of the CO ambient standards.

This report qualitatively evaluates the CSP's health risks associated with potential exposure to TACs. This analysis focuses on the proximity of proposed sensitive land uses to land uses that could generate TACs, such as roads and industrial development.

This report also evaluates the CSP's potential for land use conflicts from odors. The analysis focuses on the proximity of sensitive land uses to land

uses that could generate odors, such as commercial and industrial development.

Finally, the report estimates greenhouse gas emissions (GHG) associated with the proposed CSP. Several mitigation measures were identified that could reduce the amount of GHGs produced by the CSP.

Project Description

The proposed Creekview Specific Plan (CSP) project site is 501 acres located immediately west and north of the City's existing boundary, north of the planned extension of Blue Oaks Boulevard and north of the Roseville Energy Park, in unincorporated Placer County. (see Figure 1). The project site is located approximately two miles west of the Blue Oaks Boulevard interchange on SR 65.

The CSP is a proposed specific plan project that would include development of a mix of land uses, including 2,098 residential units, 27 acres of commercial and office uses, approximately 46 acres of public/quasi-public land uses, 149 acres of parks and open space uses, and 40 acres of urban reserve. (see Figure 2).

There are three project alternatives being considered. Alternative 1 represents the no project/no build alternative. Alternative 2, the reduced density/same footprint alternative, would reduce the number of residential units by 30% and reduce commercial/mixed use development by 30% with the same overall project footprint. Alternative 3, the high density/compact development alternative, would have the same number of residential units and the same commercial and mixed use square footage as the Proposed Project, but on a 30% smaller development footprint.

This technical report describes existing air quality conditions, summarizes the air quality and greenhouse gas (GHG) regulatory environment, and analyzes potential short-term and long-term air quality and GHG impacts of the proposed project.

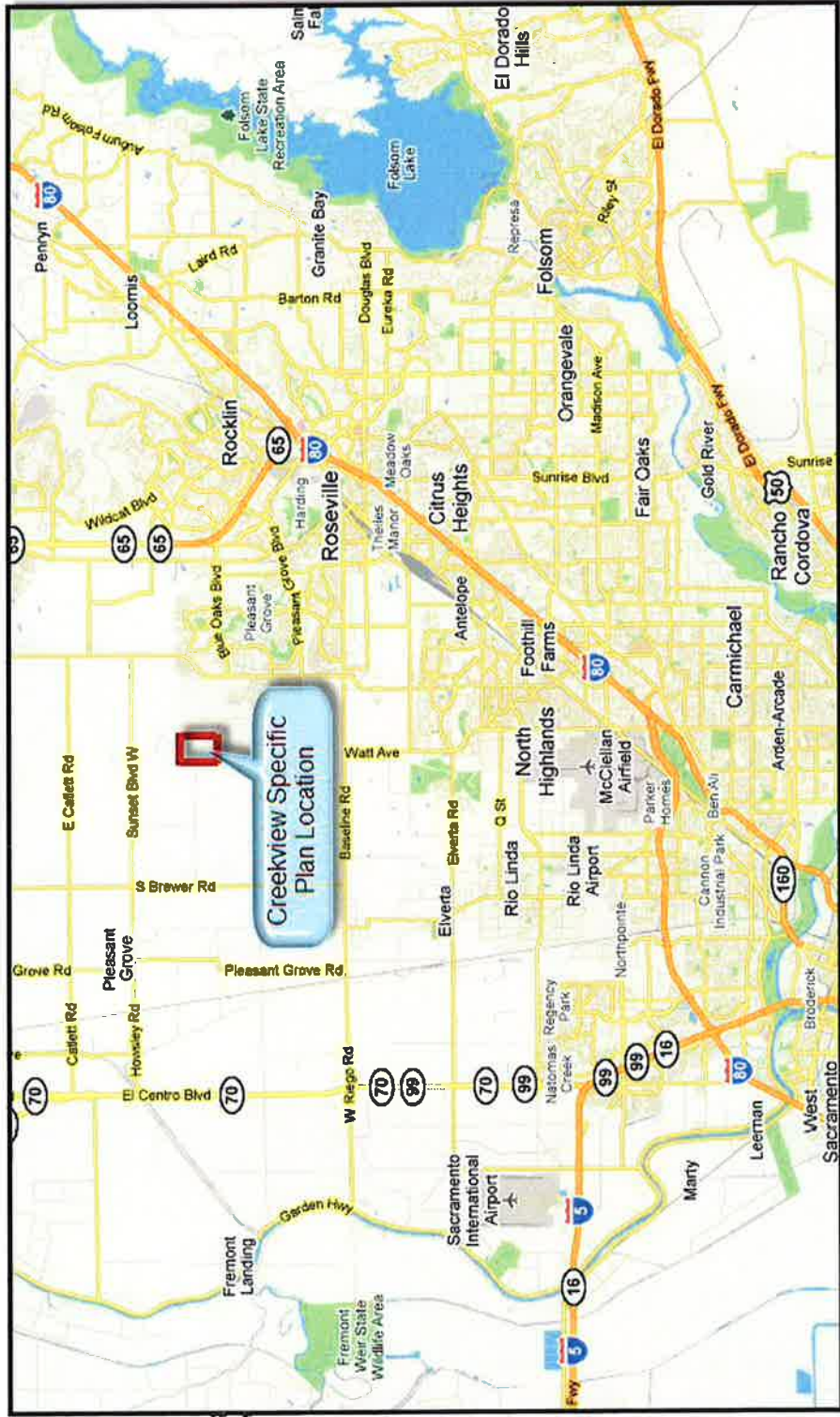


Figure 1. Regional Project Location

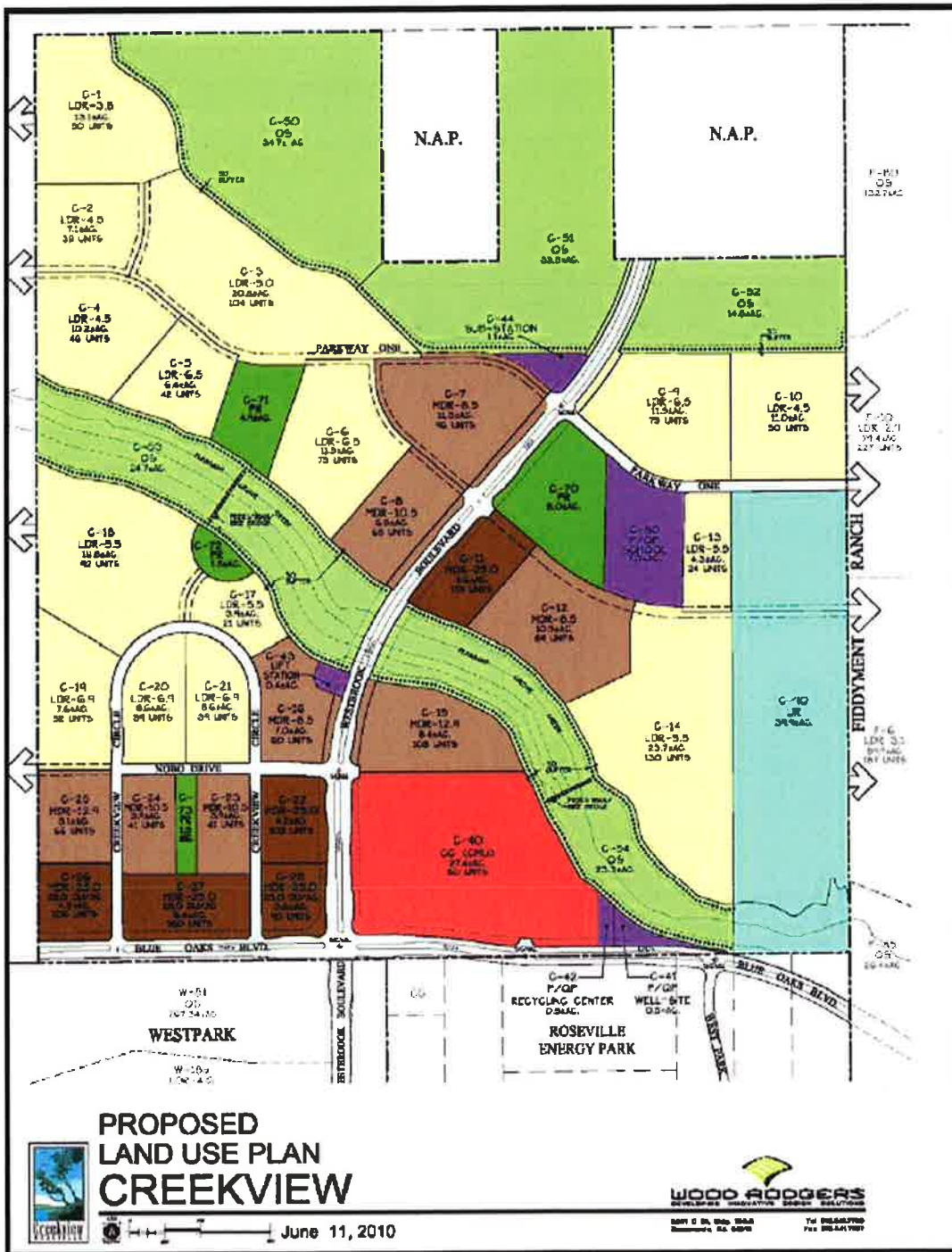


Figure 2. Creekview Specific Plan Land Use Map

Environmental Setting

Existing Air Quality Conditions

Climate and Topography

The City of Roseville is located in southern Placer County within the Sacramento Valley Air Basin (SVAB). The SVAB contains the southern portion of Placer County and ten other counties including Shasta, Tehama, Colusa, Yolo, East Solano, Butte, Yuba, Sutter, Glenn and Sacramento County.

The SVAB is surrounded by the Coast Range to the west, the Cascade Range to the north, and Sierra Nevada mountains to the east. The winters are wet and cool and the summers are hot and dry.

Air pollution can be transported into the basin, but on smoggy days, air pollution emissions from within the basin are the most significant. The southern portions of the SVAB receive air pollution inflow, transported from the Bay Area or San Joaquin Valley air basins. On many summer days, a “delta breeze” blows toward Sacramento from the ocean through the Carquinez Strait. These winds can transport air pollution from the Bay Area to the SVAB.

The delta breeze blows Sacramento’s air pollution toward the north end of the Sacramento Valley and east into the Sierra Nevada foothills. On days when wind blows from the north, Sacramento air pollution can be transported to the south into the San Joaquin Air Basin.

Air Pollutants and Ambient Air Quality Standards

Ambient air quality is affected by pollutants emitted from stationary and mobile sources. Stationary sources are often divided into point sources and area sources. Point sources consist of one or more emission sources at a facility with an identified location and are usually associated with manufacturing and industrial processing plants. Area sources are widely distributed and consist of many small emission sources. Area source

examples include lawnmowers and other landscape maintenance equipment, natural gas fired water and space heaters, and consumer products such as paints, hairspray, deodorant, and similar products with evaporative emissions. Mobile sources refer to emissions from motor vehicles, including tailpipe, evaporative, and fugitive emissions.

Air pollutants emitted by stationary and mobile sources are regulated by federal and state law. These regulated pollutants are known as “criteria air pollutants”, and are emitted as primary and secondary pollutants.

Primary criteria air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), and most forms of particulate matter (PM₁₀ and PM_{2.5}) are primary air pollutants. Secondary criteria air pollutants are those formed by chemical and photochemical reactions in the atmosphere. Ozone and nitrogen dioxide are the principal secondary pollutants.

The U.S. Environmental Protection Agency has developed National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants. At the state level, the California Air Resources Board has developed California Ambient Air Quality Standards (CAAQS). Table 1 shows the NAAQS and CAAQS. Areas that do not meet the NAAQS and/or CAAQS are classified as nonattainment areas.

The SVAB is nonattainment for the federal and state ozone, and PM_{2.5} standards. The Placer County portion of the SVAB is in nonattainment for federal PM₁₀ standards (Table 2).

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials; it causes extensive damage to plants, such as leaf discoloration and cell damage.

State standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 ppm, not to be exceeded. EPA recently replaced the 1-hour federal ozone standard with an 8-hour standard of 0.075 ppm, while ARB recently enacted a state 8-hour standard of 0.07 ppm.

Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, including

reactive organic gases (ROGs) and oxides of nitrogen (NO_x), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. ROG and NO_x are emitted by mobile sources, area sources, and stationary combustion equipment.

Table 1. California and National Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS ^a	NAAQS ^b
Ozone (O ₃)	1 hour	0.09 ppm	NA
	8 hours	0.070 ppm	0.075 ppm
Carbon monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hours	9.0 ppm	9 ppm
Nitrogen dioxide (NO ₂)	1 hour	0.18 ppm	0.100 ppm
	Annual	0.030 ppm	0.053 ppm
Sulfur dioxide (SO ₂)	1 hour	0.25 ppm	75 ppb
	3 hours	NA	0.5 ppm
	24 hours	0.04 ppm	0.14 ppm
	Annual	NA	0.03 ppm
Inhalable particulate matter (PM10)	24 hours	50 µg/m ³	150 µg/m ³
	Annual	20 µg/m ³	NA
Fine particulate matter (PM2.5)	24 hours	NA	35 µg/m ³
	Annual	12 µg/m ³	15 µg/m ³
Sulfates	24 hours	25 µg/m ³	NA
Lead (Pb)	30 days	1.5 µg/m ³	NA
	Calendar quarter	NA	1.5 µg/m ³
Hydrogen sulfide	1 hour	0.03 ppm	NA
Vinyl chloride	24 hours	0.010 ppm	NA

Source: California Air Resources Board 2010a.

Note: NA = not applicable, ppm = parts per million.

^aThe CAAQS for ozone, CO, SO₂ (1- and 24-hour), NO₂, PM10, and PM2.5 are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

^bThe NAAQS, other than ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

Table 2. Sacramento Valley Air Basin State and National Ambient Air Quality Attainment Status

Air Pollutant	Attainment Status – SVAB
Ozone (O ₃)	Nonattainment for NAAQS 8-hour; nonattainment for CAAQS 1-hour and 8-hour
Carbon monoxide (CO)	Attainment/maintenance for federal standards; unclassified for state standards
Nitrogen dioxide (NO ₂)	Attainment
Sulfur dioxide (SO ₂)	Attainment
Particulate matter (PM10)	Attainment for NAAQS; nonattainment for CAAQS
Particulate matter (PM2.5)	Nonattainment for NAAQS; nonattainment for CAAQS
Sulfates	Attainment
Lead (Pb)	Attainment
Hydrogen sulfide	Unclassified

Source: California Air Resources Board, 2010b

Table 3 shows monitoring results for the ozone monitoring station closest to the proposed project, which is located in the City of Roseville. This station shows several violations of the state and federal ozone standards during the most recent three years of monitoring.

Table 3. Ozone Monitoring Results at the Roseville North Sunrise Monitoring Station

Ozone (O ₃)	2007	2008	2009
Highest 1-hour average, ppm	0.109	0.134	0.113
Highest 8-hour average, ppm	0.100	0.106	0.101
Days > state 1-hour standard	4	20	13
Days > state 8-hour standard	20	38	32
Days > federal 8-hour standard	8	22	19
Percent of year covered	96	99	99

Sources: California Air Resources Board 2010c.

Carbon Monoxide

CO is inert to plants and materials but can significantly affect human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches and nausea to death.

State and federal CO standards have been set for both 1- and 8-hour averaging times. The state 1-hour standard is 20 ppm, and the federal 1-

hour standard is 35 ppm. Both the state and federal standards for the 8-hour averaging period are 9 ppm.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when light winds combine with the formation of ground-level temperature inversions typically from evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

No CO monitoring is currently conducted in Placer County. The closest CO monitoring station is located in Sacramento County. The results from the last three years of monitoring are shown in Table 4. No violations of either the state or federal CO standards were recorded at this monitoring station during the most three recent years.

Table 4. Carbon Monoxide Monitoring Results

Carbon Monoxide (CO)	2007	2008	2009
Highest 1-hour average, ppm	5.1	2.3	N/A
Highest 8-hour average, ppm	1.73	1.90	1.66

Notes: Monitoring results for North Highlands Blackfoot Way Monitoring Station.
Sources: California Air Resources Board 2010c; U.S. Environmental Protection Agency, 2010a. N/A = not available.

Oxides of Nitrogen

NO_x contributes to smog and can injure plants and animals and affect human health. NO_x also contributes to acidic deposition and reacts with ROG in the presence of sunlight to form photochemical smog. NO_x concentrations result in a brownish color because they absorb the blue-green area of the visible spectrum, greatly affecting visibility.

NO_x is emitted primarily by combustion sources, including both mobile and stationary sources. NO_x also is emitted by a variety of area sources, ranging from wildfires and prescribed fires to water-heating and space-heating systems powered by fossil fuels.

The state NO_x standard is 0.18 ppm for the 1-hour average and 0.03 ppm for the annual average. The federal NO_x standard is 0.053 ppm on an annual average and 0.100 ppm for the 1-hour average. No violations of the NO_x standard were recorded in the SVAB during the three recent years of monitoring.

PM10 and PM2.5

Health concerns associated with suspended particulate matter (PM) focus on those particles small enough to reach the lungs when inhaled. PM can damage human health and retard plant growth, as well as reduce visibility, soil buildings and other structures, and corrode materials.

The state PM10 standards are 50 $\mu\text{g}/\text{m}^3$ as a 24-hour average and 20 $\mu\text{g}/\text{m}^3$ as an annual geometric mean. The federal PM10 standard is 150 $\mu\text{g}/\text{m}^3$ as a 24-hour average.

The federal PM2.5 standards are 35 $\mu\text{g}/\text{m}^3$ as a 24-hour average and 15 $\mu\text{g}/\text{m}^3$ as an annual average. The state PM2.5 standard equals 12 $\mu\text{g}/\text{m}^3$ on an annual average.

PM10 and PM2.5 emissions are generated by a wide variety of sources, including agriculture, industrial activities, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

Table 5 shows the past three years worth of PM10 and PM2.5 monitoring results for the Roseville North Sunrise monitoring station. One violation of the state PM10 standard was recorded at this monitoring location. The Roseville North Sunrise monitoring station also recorded one violation of the federal 8 hour PM2.5 standard during the most recent three years.

Table 5. Particulate Matter Monitoring Results at the Roseville North Sunrise Monitoring Station

Particulate Matter (PM10)	2007	2008	2009
Highest 24-hour average, $\mu\text{g}/\text{m}^3$	45.0	73.9	33.6
Days > state standard ^a	0	1	0
Days > federal standard ^a	0	0	0
Percent of year covered	98	100	100
Particulate Matter (PM2.5)	2007	2008	2009
Highest 24-hour average, $\mu\text{g}/\text{m}^3$	30.0	<u>60.0</u>	22.6
Days > federal standard ^a	0	1	0
Percent of year covered	96	92	99

Note: Underlined values represent those in excess of applicable NAAQS. **Bold values** represent those in excess of the applicable CAAQS.

Source: California Air Resources Board, 2010c.

^aDays over state or federal standards are measured days, not estimated days.

Sulfur Dioxide

The major health concerns associated with inhalation of SO₂ include effects on breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Children, the elderly, and people with asthma, cardiovascular disease, or chronic lung diseases—such as bronchitis or emphysema—are most susceptible to adverse health effects from exposure to SO₂. SO₂ is a precursor to sulfates, which are associated with acidification of lakes and streams, accelerated corrosion of buildings and monuments, reduced visibility, and other adverse health effects.

EPA's health-based NAAQS for SO₂ is 0.03 ppm measured as an annual arithmetic mean concentration, 0.14 ppm measured over a 24-hour period, and 0.5 ppm measured over a 3-hour average period. California's SO₂ standard is 0.04 ppm measured over a 24-hour average period and 0.25 ppm measured over 1-hour.

SO₂ belongs to the family of gases called sulfur oxides (SO_x). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and also during metal smelting and other industrial processes. SO_x emissions are typically not a concern for land use development projects such as the CSP.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include health problems, proximity to emission sources, or duration of exposure to air pollutants. Sensitive receptors are typically defined as locations where human populations, especially children, seniors, or sick persons, are found, and there is reasonable expectation of continuous human exposure. Examples of land uses considered to be sensitive receptors are residences, hospitals, day cares, and schools.

Greenhouse Gases and Climate Change

Global climate change results from GHG emissions, which are caused by several activities, including combustion of fossil fuels, deforestation, and land use change.

GHGs play a critical role in the Earth's radiation budget by trapping infrared radiation emitted from the Earth's surface, which could have otherwise escaped to space. Prominent GHGs contributing to this process include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and certain refrigerants that include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs). This phenomenon, known as the "greenhouse effect", keeps the Earth's atmosphere near the surface warmer than it would be otherwise and allows for successful habitation by humans and other forms of life.

Global warming potential (GWP) is a measure of how much a given mass of GHG is estimated to contribute to global warming. It is a relative scale which compares the gas in question to that of the same mass of carbon dioxide (whose GWP is by definition 1). In this analysis, CH₄ is assumed to have a GWP of 21 and N₂O has a GWP of 310 (California Climate Action Registry, 2009). Refrigerants have GWP's that range from 76 up to 12,240 (U.S. Green Building Council, 2007). Consequently, using each pollutant's GWP, emissions of CO₂, CH₄, N₂O, CFCs, HCFCs, and HFCs can be converted into CO₂ equivalence, also denoted as CO₂e.

Fossil fuel combustion removes carbon stored underground and releases it into the active carbon cycle, thus increasing concentrations of GHGs in the atmosphere. Emissions of GHGs in excess of natural ambient concentrations are theorized to be responsible for the enhancement of the greenhouse effect and contribute to what is termed "global warming", a trend of unnatural warming of the Earth's natural climate. Increases in these gases lead to more absorption of radiation and warm the lower atmosphere further, thereby increasing evaporation rates and temperatures near the surface. Climate change is a global problem, and GHGs are global pollutants, unlike criteria pollutants (such as ozone, carbon monoxide, and particulate matter) and toxic air contaminants (TACs), which are pollutants of regional and local concern.

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme. IPCC's mission is to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, including the potential impacts and options for adaptation and mitigation. IPCC predicts substantial increases in global temperatures of between 1.1 to 6.4 degrees Celsius, depending on the scenario (Intergovernmental Panel on Climate Change 2007).

Climate change could impact California's natural environment in the following ways (California Energy Commission 2005):

- Rising sea levels along the California coastline, particularly in San Francisco and the Sacramento-San Joaquin River Delta due to ocean expansion;
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;
- An increase in heat-related human deaths and infectious diseases and a higher risk of respiratory problems caused by deteriorating air quality;
- Reduce snow pack and stream flow in the Sierra Nevada mountains, affecting winter recreation and water supplies;
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding;
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield; and
- Changes in distribution of plant and wildlife species due to changes in temperature, competition of colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems could occur at a time when California's population is expected to increase from 34 million to 59 million by the year 2040 (California Energy Commission 2005).

Consequently, for a "business as usual" scenario, increases are expected in the amount of anthropogenic GHG emissions and the number of people potentially affected by climate change. Similar changes as those noted above for California would also occur in other parts of the world.

Transportation generates 41 percent of California's GHG emissions, followed by the industrial sector (23%), electricity generation (20%), agriculture and forestry (8%), and other sources (8%). Emissions of CO₂ and N₂O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills. Sinks of carbon dioxide include uptake by vegetation and dissolution into the ocean.

Regulatory Setting

Federal

Federal air quality laws regulate air pollutants, primarily through industry-specific standards and planning requirements. The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990. Federal air quality laws regulate criteria, toxic, and nuisance air pollutant emissions from industrial sources.

As mentioned earlier, criteria pollutants are substances for which the U.S. Environmental Protection Agency (EPA) has established the NAAQS. Noncriteria air pollutants, also known as toxic air contaminants (TACs), are airborne substances capable of causing adverse health effects as a result of short-term (acute) or long-term (chronic) exposure.

Nuisance pollutants are substances that can result in complaints from the population about adverse impacts on quality of life. The nuisance pollutants regulated by the air districts are odors and visible plumes (smoke).

State

Criteria Pollutants

The California Air Resources Board (ARB), which is part of the California Environmental Protection Agency (Cal-EPA), develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires areas to develop plans and strategies for attaining California ambient air quality standards (CAAQS) as set forth in the California Clean Air Act of 1988. As described above, California has developed ambient standards for the criteria pollutants equal to or more stringent than the federal standards.

Air Toxics

State requirements specifically address air toxics issues through Assembly Bill (AB) 1807 (known as the Tanner Bill), which established the state air toxics program, and AB 2588, the Air Toxics Hot Spots Information and Assessment Act. The air quality regulations developed from these bills

have been modified recently to incorporate the federal regulations associated with the federal Clean Air Act Amendments of 1990.

The Air Toxics Hot Spots Information and Assessment Act (AB 2588, 1987, Connelly) (Hot Spots Act) was enacted in September 1987. Under this bill, stationary sources of emissions are required to report the types and quantities of certain substances that their facilities routinely release into the air.

Local

At the local level, air quality is managed through land use and development planning practices. These practices are implemented through general planning processes. The Placer County Air Pollution Control District (PCAPCD) is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. Specifically, the PCAPCD is responsible for monitoring air quality and planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the area. Programs developed include air quality rules and regulations that regulate stationary source emissions, including area and point sources and certain mobile source emissions. The PCAPCD is also responsible for establishing permitting requirements and issuing permits for stationary sources and ensuring that new, modified, or relocated stationary sources do not create net emissions increases. The PCAPCD enforces air quality rules and regulations through a variety of means, including inspections, educational and training programs, and fines.

Greenhouse Gas Emissions and Global Climate Change Regulatory Environment

Several recent state-level actions have been taken to limit greenhouse gas (GHG) emissions implicated in global warming. Those actions are described below.

Executive Order S-3-05

On June 1, 2005, California Governor Arnold Schwarzenegger issued Executive Order S-3-05. It included the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80% below 1990 levels. To meet the targets, the governor

directed several state agencies to cooperate in the development of a climate action plan. The secretary of Cal-EPA leads the Climate Action Team (CAT), whose goal is to implement global warming emission reduction programs identified in the climate action plan and to report on the progress made toward meeting the emission reduction targets established in the executive order.

The first report to the governor and the legislature was released in March 2006 and will be issued bi-annually thereafter. The CAT report to the governor contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met (California Environmental Protection Agency 2006).

California Global Warming Solutions Act of 2006 (Assembly Bill 32)

In 2006, the California state legislature adopted the California Global Warming Solutions Act of 2006 (AB 32). AB 32 establishes a cap on statewide GHG emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emission levels. Under AB 32, GHGs are defined as carbon dioxide (CO₂), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

AB 32 requires that ARB:

- adopt early action measures to reduce GHGs.;
- establish a statewide GHG emissions cap for 2020 based on 1990 emissions;
- adopt mandatory report rules for significant GHG sources;
- adopt a scoping plan indicating how emission reductions will be achieved via regulations, market mechanisms, and other actions; and
- adopt regulations needed to achieve the maximum technologically feasible and cost-effective reductions in GHGs.

Early Action Measures

ARB has adopted several early action measures to reduce GHG. They include things such as improvements to landfill methane capture, a vehicle tire pressure program, improvements to heavy duty truck efficiency, and a low carbon fuels standard (LCFS). On April 23, 2009, the California Air Resources Board adopted a LCFS. This standard requires that all fuels sold in California must have a reduced carbon content that will lower emissions by 10% by 2020.

Guidance and protocols for businesses and governments to facilitate GHG emission reductions were approved as early action items by the Board at its June 2007 hearing. A Local Government Toolkit was designed to provide guidance and resources to help cities and counties reduce greenhouse gas emissions and save money. No specific regulations have yet been set by the California Air Resources Board that applies specifically to cities and counties.

A variety of tools are available to assist with climate action planning including information on:

- How to calculate and inventory current GHG emissions,
- A recommended target to reduce GHG emissions,
- Cost-saving strategies to take action now,
- Financial resources to get started, and
- Case studies to learn what other cities have been able to accomplish,

California's Scoping Plan and GHG Emissions Cap

In its recently released Climate Change Scoping Plan, ARB lays out the GHG reductions that need to be achieved, and the types of measures that will be used to reach them. The Plan shows that California's 1990 GHG emissions equaled 427 million metric tons CO₂e, 2002-2004 average emissions equaled 469 million metric tons CO₂e, and 2020 GHG emissions would equal 596 million metric tons CO₂e. Consequently, compared to 1990, emissions would need to be reduced by 169 million metric tons CO₂e, and about 42 million metric tons from 2002-2004 levels (California Air Resources Board, 2008).

The measures that will be used to achieve these emission reductions include the early action measures described above, plus 18 additional categories of measures:

- 1) California Cap-and-Trade Program
- 2) California Light-Duty Vehicle GHG Gas Standards
- 3) Energy Efficiency
- 4) Renewables Portfolio Standard
- 5) Low Carbon Fuel Standard
- 6) Regional Transportation-Related GHG Targets
- 7) Vehicle Efficiency Measures

- 8) Goods Movement
- 9) Million Solar Roofs Program
- 10) Medium/Heavy-Duty Vehicles
- 11) Industrial Emissions
- 12) High Speed Rail
- 13) Green Building Strategy
- 14) High Global Warming Potential Gases
- 15) Recycling and Waste
- 16) Sustainable Forests
- 17) Water
- 18) Agriculture

The California Air Resources Board has initiated development of measures for each of these categories.

SB 375

This regulation, enacted in September 2008, is designed to control GHGs by limiting urban sprawl. It requires metropolitan planning organizations (MPOs) to include sustainable communities strategies (SCS), as defined, in their regional transportation plans (RTPs) for the purpose of reducing greenhouse gas emissions. SB 375 also aligns planning for transportation and housing, and creates specified incentives for the implementation of the strategies.

Senate Bill 97

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under the California Environmental Quality Act (CEQA). The bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. The Resources Agency certified those guidelines prior to January 1, 2010.

Actions Taken by the California Natural Resources Agency

On February 16, 2010, the Office of Administrative Law approved the GHG CEQA Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations.

On March 18, 2010, the Natural Resources Agency adopted the proposed CEQA Guideline amendments as proposed by OPR. The adopted CEQA Guideline amendments require lead agencies to:

- Calculate or estimate the amount of GHGs produced by a project using either a quantitative modeling approach or a qualitative approach that includes performance standards,
- Use one or more of several approaches to determine the significance of emissions, including:
 - the amount of the project's emissions increase over existing conditions,
 - the level of emissions compared to a significance threshold, and/or whether the
 - project complies with an existing statewide, regional, or local plan to mitigate GHG emissions.

Actions Taken by California Attorney General's Office

The California Attorney General (AG) has filed comment letters under CEQA about a number of proposed projects. The AG has also filed several complaints and obtained settlement agreements for CEQA documents covering general plans and individual programs that the AG found either failed to analyze GHG emissions or failed to provide adequate GHG mitigation. The AG's office has prepared a report that lists measures that local agencies should consider under CEQA to offset or reduce global warming impacts. The AG's office also has prepared a chart of modeling tools to estimate GHG emissions impacts of projects and plans. The GHG analysis described in this chapter uses two of the tools listed by the AG: URBEMIS and EMFAC. URBEMIS was used to estimate area source emissions, such as space and water heating. Information on the AG's actions can be found on at the California Department of Justice Office of Attorney General web site (California Department of Justice 2010).

California Air Pollution Control Officers Association Guidance

The California Air Pollution Control Officers Association released a January 2008 report that describes methods to estimate and mitigate GHG emissions from projects subject to CEQA (CAPCOA 2008). CAPCOA also has released documents that provide GHG policies for general plans (CAPCOA 2009) and for quantifying GHG mitigation measures (CAPCOA 2010).

Impact Analysis

Significance Thresholds

The PCAPCD regulates and oversees air quality within the CSP area and has recommended the following thresholds to determine whether or not a project will result in a significant impact to air quality:

- Exceed the PCAPCD thresholds for construction or operational emissions:
 - Reactive Organic Gases (ROG): 82 lbs/day
 - Nitrogen Oxides (NOX): 82 lbs/day
 - Particulate Matter (PM10): 82 lbs/day
 - Carbon Monoxide (CO): 550 lbs/day [Chang, pers. comm.]
- Generate localized concentrations of CO that exceed the 1-hour 20 parts per million (ppm) or the 8-hour 9 ppm air quality standards;
- Result in a cumulatively considerable net increase in any criteria air pollutant for which the project region is nonattainment;
- Expose sensitive receptors to substantial pollutant concentrations, or;
- Create objectionable odors affecting a substantial number or people.

To date, neither the Placer County Air Pollution Control District nor the City of Roseville has identified significance thresholds for greenhouse gases.

Approach and Methodology

Construction Emissions Methodology

The CSP project includes development of residential, commercial, public, and utility land uses. URBEMIS2007 Version 9.2.4 was used to estimate emissions resulting from the construction of the CSP project, beginning in 2012 with completion by 2025. Emissions were estimated for each year of

construction and a constant rate of construction was assumed over the entire Buildout period. A detailed list of the assumptions used to estimate construction emissions is included in Appendix A.

Operational Emissions Methodology

Criteria Pollutant Emissions

The CSP project would generate operational emissions of the criteria pollutants, including ozone precursors (ROG and NO_x), CO, PM₁₀, PM_{2.5}, and SO_x. Sox emissions are typically a minor source of emissions and are not considered a concern with land use development projects. Therefore, they are not discussed further in this report. On road traffic emissions generated by the project were estimated using the URBEMIS2007 model and trip generation information provided by the traffic consultant (DKS Associates, 2010).

The URBEMIS2007 model was also used to estimate area source emissions. Area sources include emissions associated with burning natural gas for space and water heating, wood combustion associated with space heating, gasoline combustion to operate landscape maintenance machinery, and evaporative emissions from the use of architectural coatings and consumer products.

Carbon Monoxide Concentrations

Project concentrations from local traffic were evaluated by modeling roadside CO concentrations. CO modeling was conducted for the five most highly congested road links and associated intersections identified in the traffic report (DKS Associates, 2010). All road links shown in the circulation element with level of service (LOS) of D, E, or F were identified and the five with the highest traffic volumes and worst intersection levels of serve were evaluated to determine CO concentrations.

The analysis used the CALINE4 line source dispersion model and procedures developed by Caltrans and approved by EPA (Garza, et. al. 1997). CO concentrations were modeled using traffic volumes, emissions, meteorology, and the roadway/receptor geometry. This analysis used meteorological conditions most conducive to high CO concentrations in the SVAB. Appendix A contains additional information describing how CO modeling was conducted.

Toxic Air Contaminants

Potential health risks associated with the proposed project were evaluated qualitatively. First, sensitive receptors that could be exposed to TAC

emissions were identified. These included residences and schools located adjacent to the CSP commercial land use areas. Sensitive receptors also include residential areas and schools within the CSP that could be exposed to TACs either from within the CSP or from adjacent areas. Then, those residential land uses were evaluated to determine whether they were downwind of industrial areas.

In addition, sensitive land uses were examined to identify proximity to highways and arterials with high traffic volumes. Several studies have shown health effects associated with the distance between residences and traffic levels (California Air Resources Board, 2005). These studies have found a link between traffic-related emissions and adverse health effects within 1,000 feet of roads, with the effects strongest within 300 feet. This indicates that the adverse effects diminish with distance. Consequently, the California Air Resources Board recommends against siting new sensitive land uses within 500 feet of a freeway or urban roads at or exceeding 100,000 average annual daily trips (AADT) (California Air Resources Board, 2005).

Odors

Potential odor impacts were evaluated by examining the distances from existing and proposed odor sources (areas designated for industrial land uses) to sensitive receptors such as residences. The analysis also considers prevailing wind direction and policies designed to minimize odor impacts. Odor sources typically include industrial land uses, such as fiberglass manufacturing, coating operations, foundries, refineries, sewage treatment plants, landfills, and recycling facilities (California Air Resources Board, 2005).

Greenhouse Gas Emissions Methodology

Transportation-related GHG emissions were estimated using the same approach as described above under criteria pollutant emissions. GHGs produced by electricity generation and from solid waste disposal were also estimated. For electricity, both direct and indirect electricity use (associated with water and wastewater) was estimated. For residential land uses, direct electricity use was estimated using the California Energy Commission's (CEC's) Residential Appliance Saturation Survey (KEMA-XENERGY, Itron, and RoperASW, 2004). For non-residential land uses, a CEC database was used which contains information on kilowatts consumed per square foot for various types of commercial land uses (Itron, Inc., 2006).

The analysis also estimated indirect electricity use associated with water consumption and wastewater treatment. Estimates of water-related energy use were based on two reports prepared for this project (MacKay &

Somps, 2010; and HydroScience Engineers, Inc. 2010). Energy consumption associated with water use was obtained from a report prepared for the California Energy Commission (Navigant Consulting 2006).

Once total electricity use was estimated, the GHGs associated with that electricity use were estimated using emission factors specific to Roseville Electric (CAPCOA, 2010).

Emissions from the solid waste generated by the proposed project were estimated based solid waste generation rates developed for this project (McKinney, pers. comm.). Emission estimates for solid waste decomposition were based on emission factors that show a net carbon benefit for landfills that burn waste to generate energy (U.S. EPA 2010b).

Impacts and Mitigation Measures of the CSP Proposed Development

Construction Emissions

Construction of CSP Without Urban Reserve

Table 6 shows annual construction emissions associated with the proposed CSP without the Urban Reserve. Improvements in emission controls and the turnover in the construction fleet result in decreasing emissions over time. Construction emissions exceed the 82 pounds per day significance threshold for NOx and PM10.

Table 6. Buildout Construction Emissions excluding Urban Reserve (unmitigated, pounds per day)

Year	ROG	NOx	CO	PM10	PM2.5	CO ₂
2012	50	128	104	473	104	1,800
2013	49	119	99	472	103	2,207
2014	48	110	95	471	103	2,207
2015	47	101	90	471	102	2,207
2016	46	92	87	470	102	2,207
2017	45	84	84	470	101	2,198
2018	44	77	81	469	101	2,207
2019	44	70	78	469	100	2,207
2020	43	64	76	469	100	2,215
2021	43	63	70	469	100	2,207
2022	43	63	70	469	100	2,199
2023	43	63	70	469	100	2,199
2024	43	63	70	469	100	2,216
2025	43	63	70	469	100	1,195
Threshold	82	82	550	82	None	None

Notes: CO₂ emissions in metric tons per year, all other pollutants in pounds per day. Detailed results in Appendix A. Bolded values indicate emissions exceed PCAPCD significance threshold.

Construction of CSP With Urban Reserve

Table 7 shows annual construction emissions for the CSP with the Urban Reserve. Construction emissions exceed the 82 pounds per day significance threshold established by the PCAPCD for NOx and PM10.

Table 7. Buildout Construction Emissions including Urban Reserve (unmitigated, pounds per day)

Year	ROG	NOx	CO	PM10	PM2.5	CO ₂
2012	57	144	118	522	115	2,017
2013	56	134	112	522	114	2,505
2014	54	124	107	521	113	2,505
2015	53	113	102	520	113	2,506
2016	52	103	98	520	112	2,506
2017	51	94	95	519	112	2,496
2018	50	85	92	519	111	2,506
2019	49	78	89	518	111	2,506
2020	49	71	86	518	111	2,515
2021	48	69	80	518	111	2,506
2022	48	69	80	518	111	2,496
2023	48	69	80	518	111	2,496
2024	48	69	80	518	111	2,516
2025	48	69	80	518	111	1,342
Threshold	82	82	550	82	None	None

Notes: CO₂ emissions in metric tons per year, all other pollutants in pounds per day. Detailed results in Appendix A. Bolded values indicate emissions exceed PCAPCD significance threshold.

Construction Mitigation Measures

Mitigation Measure AQ-1: The following measures will reduce construction-related NO_x, PM₁₀ and PM_{2.5} emissions:

- All construction equipment shall be maintained in good operating condition. Contractor shall ensure that all construction equipment is being properly serviced and maintained as per the manufacturer's specifications. Maintenance records shall be available at the construction site for verification. This measure will reduce combustion emissions of all criteria air pollutants.
- Prior to the issuance of any grading permits, all applicants shall submit construction plans denoting the proposed schedule and projected equipment use. Construction contractors shall provide evidence that low emission mobile construction will be used, or that their use was investigated and found to be infeasible for the project. Low emission equipment is defined as meeting the California Air Resources Board's Tier III standards. Contractors shall also conform to any construction measures imposed by the PCAPCD as well as City Planning Staff. This measure will primarily reduce ROG, NO_x, PM₁₀, and PM_{2.5} exhaust emissions.
- Paints and coating shall be applied either by hand or by high volume, low-pressure spray. This measure will reduce evaporative ROG emissions.
- All construction shall comply with the following measures to reduce fugitive dust related emissions of PM₁₀ and PM_{2.5}:
 - Maintain a minimum 24-inch freeboard on soil haul trucks or cover payloads using tarps or other suitable means.
 - Suspend grading operations during high winds.
 - Sweep streets as necessary if silt is carried off-site to adjacent public thoroughfares or occurs as a result of hauling.
 - Dispose of surplus excavated material in accordance with local ordinances and use sound engineering practices.
 - Schedule activities to minimize the amounts of exposed excavated soil during and after the end of work periods.

- Phase grading to prevent the susceptibility of large areas to erosion over extended periods of time.
- Pave or apply gravel to any on-site haul roads.
- Reestablish ground cover on the construction site through seeding and water.

Table 8 shows estimated emissions of criteria pollutants after mitigation for the CSP without the Urban Reserve, while Table 9 shows mitigation emissions for the CSP plus the Urban Reserve. Mitigation would reduce PM10 emissions to below the PCAPCD’s significance thresholds. However, NOx emissions would still exceed PCAPCD’s 82 pounds per day significance threshold under both scenarios.

Table 8. Buildout Construction Emissions excluding Urban Reserve (mitigated, pound per day)

Year	ROG	NOx	CO	PM10	PM2.5	CO ₂
2012	50	128	104	40	13	1,800
2013	49	119	99	39	13	2,207
2014	48	110	95	39	12	2,207
2015	47	101	90	38	12	2,207
2016	46	92	87	37	11	2,207
2017	45	84	84	37	11	2,198
2018	44	77	81	37	10	2,207
2019	44	70	78	36	10	2,207
2020	43	64	76	36	10	2,215
2021	43	63	70	36	10	2,207
2022	43	63	70	36	10	2,199
2023	43	63	70	36	10	2,199
2024	43	63	70	36	10	2,216
2025	43	63	70	36	10	1,195
Threshold	82	82	550	82	None	None

Notes: CO₂ emissions in metric tons per year, all other pollutants in pounds per day. Detailed results in Appendix A. Bolded values indicate emissions exceed PCAPCD significance threshold.

Table 9. Buildout Construction Emissions including Urban Reserve (mitigated, pounds per day)

Year	ROG	NOx	CO	PM10	PM2.5	CO ₂
2012	57	144	118	44	15	2,017
2013	56	134	112	43	14	2,505
2014	54	124	107	43	14	2,505
2015	53	113	102	42	13	2,506
2016	52	103	98	41	12	2,506
2017	51	94	95	41	12	2,496
2018	50	85	92	40	12	2,506
2019	49	78	89	40	11	2,506
2020	49	71	86	40	11	2,515
2021	48	69	80	40	11	2,506
2022	48	69	80	40	11	2,496
2023	48	69	80	40	11	2,496
2024	48	69	80	40	11	2,516
2025	48	69	80	40	11	1,342
Threshold	82	82	550	82	None	None

Notes: CO₂ emissions in metric tons per year, all other pollutants in pounds per day. Detailed results in Appendix A.

Construction of CSP Alternatives

Alternative 1 – No Project/No Build Alternative

Alternative 1, the no project/no build alternative, would not result in any construction or associated emissions.

Alternative 2 – Reduced Density/Same Footprint Alternative

Alternative 2, the reduced density/same footprint alternative, would result in similar PM10 and PM2.5 emissions as compared to the Proposed Project because the same project footprint would be graded. Site grading represents the largest single source of PM10 and PM2.5 dust emissions associated with construction. The emissions of other criteria pollutants, including ROG and NOx, would be lower than the Proposed Project because there would be less dense development and lower construction related emissions. However, NOx emissions would still exceed the PCAPCD's significance threshold.

Construction of Alternative 2 would still result in a significant impact because emissions of NOx and PM10 would exceed the PCAPCD's significance thresholds. Implementation of Mitigation Measure AQ-1 would reduce PM10 emissions to less than the thresholds, but NOx emissions would still exceed the PCAPCD's thresholds.

Alternative 3 – High Density/Compact Alternative

Alternative 3, the high density/compact alternative, would result in lower PM10 and PM2.5 emissions as compared to the Proposed Project because less grading would be involved. However, with the same number of residential units and commercial square footage, emissions of ROG and NOx would be similar to the Proposed Project.

Alternative 3 would result in a significant impact because emissions of NOx, and PM10 would exceed the PCAPCD's significance thresholds. Implementation of Mitigation Measure AQ-1 would reduce PM10 emissions to less than the threshold, but NOx emissions would still exceed PCAPCD's thresholds.

Operational Emissions

The majority of the CSP project site is undeveloped and has historically been used for agricultural or grazing activities. Since the area is largely undeveloped, existing criteria pollutant emissions on the project site are negligible.

Operational Emissions from CSP Buildout

Buildout of the Proposed Project would generate criteria pollutant emissions from mobile and area source emissions. Table 10 summarizes operational emissions associated with 2025 buildout of the Proposed Project, Alternative 2, and Alternative 3, without and with the Urban Reserve. The estimates represent peak daily summer emissions (pounds per day).

For the Proposed Project, emissions exceed the PCAPCD thresholds for ROG, NO_x, CO, and PM₁₀. Mitigation measures are available that would reduce these emissions. Those mitigation measures are listed under the GHG impact discussion. However, as indicated in Table 11, the mitigation measures would not reduce emissions to less than the thresholds.

Alternative 1 – No Project/No Build

Under Alternative 1, operational emissions within the Creekview Specific Plan area would remain unchanged from existing levels.

Alternative 2 – Reduced Density/Same Footprint

Under Alternative 2, operational emissions would be lower than the Proposed Project (Table 10). For the without Urban Reserve scenario, Alternative 2's emissions would exceed Placer County's thresholds for ROG, CO, and PM₁₀. Emissions would be less than the PCAPCD's NO_x thresholds. With Urban Reserve included, Alternative's emissions would exceed PCAPCD's thresholds for ROG, NO_x, CO, and PM₁₀. No mitigation measures are available to reduce emissions to levels that are less than the thresholds. However, several mitigation measures listed under the GHG impact discussion would reduce both criteria pollutant and GHG emissions.

Alternative 3 – High Density/Compact Development

Under Alternative 3, operational emissions would be lower than the Proposed Project but would exceed Alternative 2 emissions (Table 10). However, emissions would still exceed Placer County’s thresholds for ROG, NOx, CO, and PM10. No mitigation measures are available to reduce emissions to levels that are less than the thresholds. However, several mitigation measures listed under the GHG impact discussion would reduce both criteria pollutant and GHG emissions.

Table 10. Operational Criteria Pollutant Emissions for Buildout of Specific Plan and Alternatives 2 and 3 (unmitigated, pounds per day)

Alternative	ROG	NOx	CO	PM10	PM2.5
Specific Plan Buildout w/o Urban Reserve					
Area Sources	143.90	26.93	84.40	0.25	0.25
Transportation	98.62	72.16	842.82	292.66	55.66
Total	242.52	99.09	927.22	292.91	55.91
Specific Plan Buildout w/ Urban Reserve					
Area Sources	169.34	30.90	93.51	0.28	0.28
Transportation	107.98	77.34	906.16	311.55	59.30
Total	277.32	108.24	999.67	311.83	59.58
Alternative 2 w/o Urban Reserve					
Area Sources	101.98	19.94	63.29	0.19	0.19
Transportation	78.66	57.75	672.04	234.01	44.51
Total	180.64	77.69	735.33	234.20	44.70
Alternative 2 w/ Urban Reserve					
Area Sources	127.41	23.91	72.41	0.21	0.21
Transportation	88.24	62.98	736.06	253.20	48.19
Total	215.65	86.89	808.47	253.41	48.40
Alternative 3 w/o Urban Reserve					
Area Sources	130.48	23.42	60.25	0.18	0.18
Transportation	92.58	66.70	777.91	270.23	51.41
Total	223.06	90.12	838.16	270.41	51.59
Alternative 3 w/o Urban Reserve					
Area Sources	155.93	27.40	69.36	0.21	0.21
Transportation	99.69	71.15	830.56	288.55	54.90
Total	255.62	98.55	899.92	288.76	55.11
PCAPCD Significance Threshold	82	82	550	82	N/A
Exceed Threshold?	Yes	Yes	Yes	Yes	No

Notes: Buildout of all scenarios assumed by 2025. Detailed calculations included in Appendix A. Transportation emissions estimated using URBEMIS2007 and several inputs from the traffic analysis, including vehicle trip generation rates and vehicle miles traveled (DKS, 2010). Area sources also estimated using URBEMIS2007. Bolded values represent emissions above PCAPCD’s thresholds.

Table 11. Operational Criteria Pollutant Emissions for Buildout of CSP Specific Plan, and Alternatives 2 and 3 (mitigated, pounds per day)

Alternative	ROG	NO _x	CO	PM10	PM2.5
Specific Plan Buildout w/o Urban Reserve					
Area Sources	140.9	21.71	81.90	0.24	0.24
Transportation	98.62	72.16	842.82	292.66	55.66
Total	239.4	93.87	924.74	292.90	55.90
Specific Plan Buildout w/ Urban Reserve					
Area Sources	165.78	24.9	90.7	0.27	0.27
Transportation	107.98	77.34	906.16	311.55	59.30
Total	273.76	102.24	996.86	311.82	59.57
Alternative 2 w/o Urban Reserve					
Area Sources	99.71	16.07	61.39	0.18	0.18
Transportation	78.66	57.75	672.04	234.01	44.51
Total	178.37	73.82	733.43	234.19	44.69
Alternative 2 w/ Urban Reserve					
Area Sources	124.68	19.27	70.18	0.21	0.20
Transportation	88.24	62.98	736.06	253.20	48.19
Total	212.92	82.25	806.24	253.41	48.39
Alternative 3 w/o Urban Reserve					
Area Sources	127.88	18.85	58.05	0.17	0.17
Transportation	92.58	66.70	777.91	270.23	51.41
Total	220.46	85.55	835.96	270.40	51.58
Alternative 3 w/ Urban Reserve					
Area Sources	152.86	22.05	66.83	0.20	0.20
Transportation	99.69	71.15	830.56	288.55	54.90
Total	252.55	93.20	897.39	288.75	55.10
PCAPCD Significance Threshold	82	82	550	82	N/A
Exceed Threshold?	Yes	Yes	Yes	Yes	No

Notes: Buildout of all scenarios assumed by 2025. Detailed calculations included in the Appendix A. Transportation emissions estimated using URBEMIS2007 and several inputs from the traffic analysis, including vehicle trip generation rates and vehicle miles traveled (DKS, 2010). Area sources also estimated using URBEMIS2007. Bolded values represent emissions above PCAPCD's thresholds.

Carbon Monoxide Concentrations

CO concentrations were estimated for the five intersections projected to be most congested in each scenario. A summary of the CO modeling results for 2025 is included in Table 12. As Table 12 shows, the maximum 1-hour and 8-hour concentrations for all intersections are substantially less than either the state or federal ambient air quality standards. Since these intersections represent worst case conditions, CO concentrations at all other intersections would also be less than federal or state standards.

The CO results demonstrate that the CSP plus cumulative buildout would not cause or contribute to violations of the state or federal CO standards. Consequently, the project would not expose sensitive receptors to substantial concentrations of CO. This is a less than significant impact.

Alternative 1 – No Project

Under Alternative 1, CO concentrations at congested intersections would not increase as a result of the Creekview Specific Plan because the Plan area would not generate any new vehicle trips.

Alternative 2 – Reduced Density/Same Footprint

CO concentrations associated with Alternative 2 would be lower than those for the Proposed Project. As compared to the Proposed Project, Alternative 2's reduced density would result in fewer vehicle trips, which would result in less congestion at intersections and lower CO concentrations. Since the Proposed Project would not result in significant CO concentrations, CO concentrations associated with Alternative 2 would be less than significant.

Alternative 3 – High Density/Compact Development

CO concentrations associated with Alternative 3 would be lower than those for the Proposed Project. As compared to the Proposed Project, Alternative 3 would result in fewer vehicle trips, which would result in less congestion at intersections and lower CO concentrations. CO concentrations associated with Alternative 3 would be less than significant.

Table 12. Modeled Carbon Monoxide Levels for 2025 Cumulative Plus Project Conditions

Intersection	Receptor	2025 Buildout ¹	
		1-hr CO	8-hr CO
Baseline Rd. and Fiddymment Rd.	1	5.7	2.3
	2	5.7	2.3
	3	5.7	2.3
	4	5.7	2.3
Pleasant Grove Blvd. and Fiddymment Road	1	5.7	2.3
	2	5.8	2.4
	3	5.6	2.3
	4	5.8	2.4
Pleasant Grove Blvd. and Roseville Parkway	1	5.8	2.4
	2	5.9	2.5
	3	5.8	2.4
	4	5.9	2.5
Fiddymment Rd. and Athens Ave.	1	5.5	2.2
	2	5.5	2.2
	3	5.5	2.2
	4	5.5	2.2
Foothills Blvd. and Vineyard Rd.	1	5.7	2.3
	2	5.7	2.3
	3	5.7	2.3
	4	5.7	2.3

Notes:

Detailed CO modeling results included in Appendix A.

¹ Background concentrations of 5.1 ppm and 1.9 ppm were added to the modeling 1-hour and 8-hour results, respectively

The federal and state 1-hour standards are 35 and 20 ppm, respectively

The federal and state 8-hour standards are 9 and 9.0 ppm, respectively

Toxic Air Contaminants (TACs)

The CSP has the potential to expose sensitive receptors to substantial concentrations of TACs in two ways: 1) by locating residences close to sources of TACs, such as industrial uses or freeways, and 2) by locating sources of TACs, such as industrial uses, upwind of residences and other sensitive receptors. This analysis evaluates the location of sensitive receptors with respect to potential sources of toxic air contaminants: industrial sources and proximity to freeways. This analysis also considers the predominant wind direction in the area.

Figure 3 shows wind rose for the Roseville area. The wind rose represents the direction from which the wind is blowing. The prevailing winds blow from the south and southeasterly directions with occasional winds from the north and northwesterly directions. Winds from the east and the west occur infrequently.

The location of industrial uses south or southeast of the proposed project could potentially result in the location of CSP residences downwind from industrial sources of TACs. Industrial sources can generate a wide variety of TACs, from fuel combustion, and from the use of hazardous chemicals that could become airborne. The location of industrially zoned areas to the east of West Side Drive in the Westpark area (south of the proposed project) could create the potential for TACs to be transported into the project area. These include potential land uses in the Panhandle area, the existing Roseville Energy Park, and Pleasant Grove Wastewater Treatment Plant (WWTP).

Figure 4 shows the location of industrially zoned areas, the Roseville Energy Park, and the Pleasant Grove WWTP in relation to the CSP. The Roseville Energy Park (Park) represents the largest potential source of TACs upwind of CSP. The Park generates TACs from natural gas combustion and from diesel emergency generator testing. The California Energy Commission conducted a screening level health risk assessment (HRA) for the Park prior to its construction. That analysis found that the Park would not cause significant acute, chronic, or carcinogenic health risks to existing or future residences in the Park's vicinity (California Energy Commission, 2004).

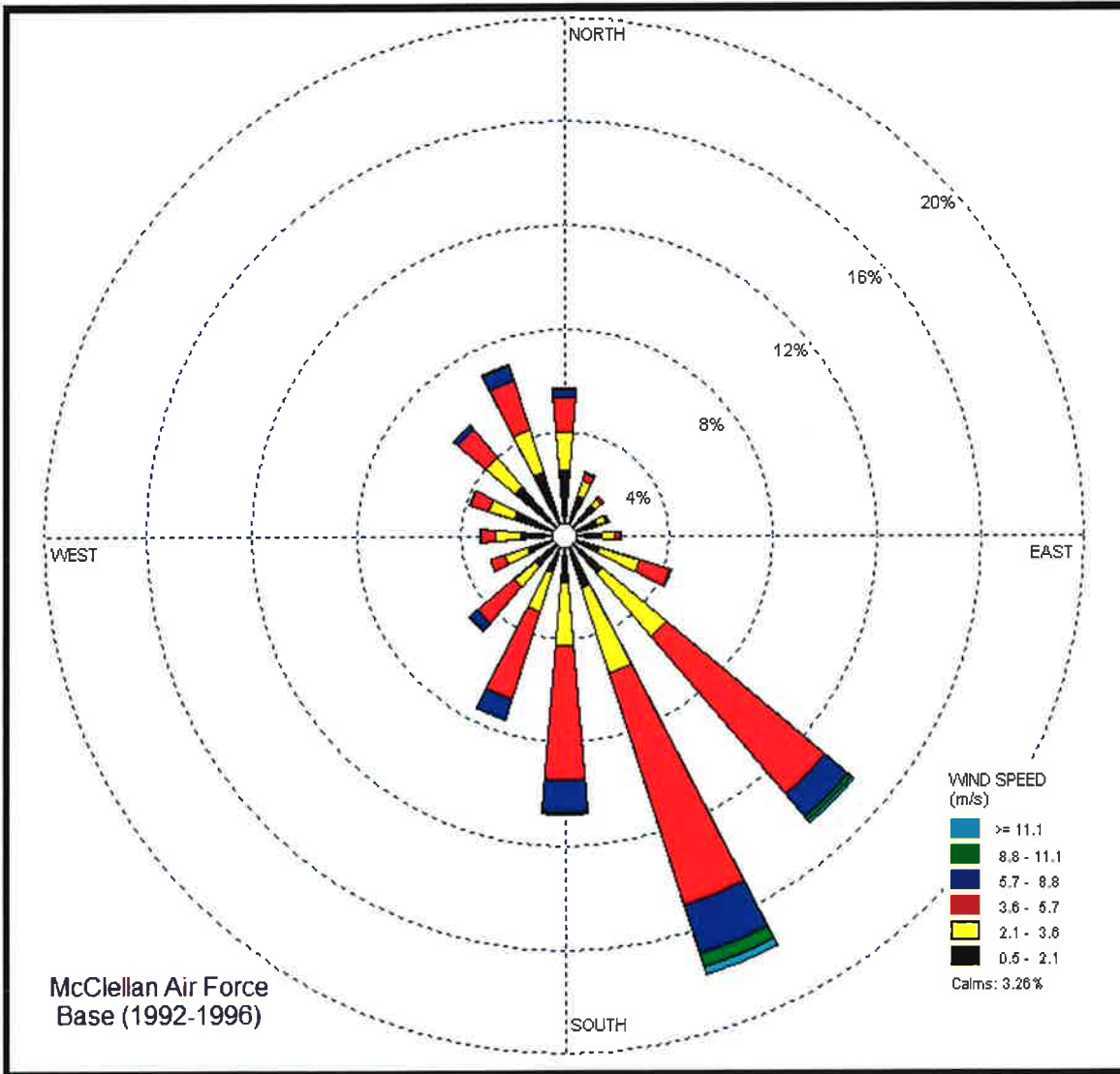


Figure 3. Wind Rose for the CSP Area

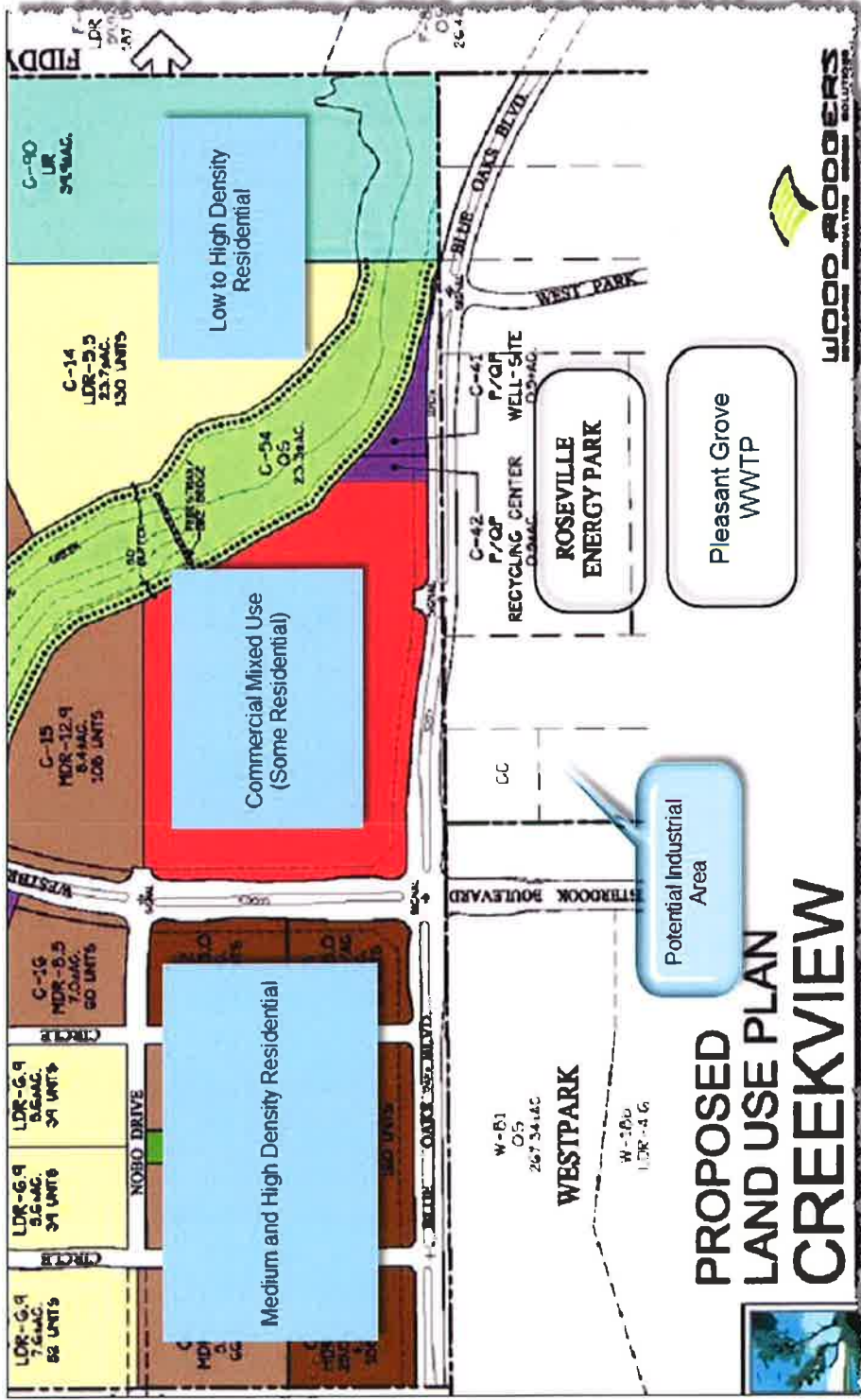


Figure 4. Location of Residential Areas Compared to Potential Sources of TACs and Odors.

The WWTP represents another source of TACs. However, the WWTP potential for generating TACs is relatively low. The primary concern for the WWTP is odors, which are discussed in the following section.

Lands in the Panhandle area south of the CSP could potentially be zoned for industrial uses. This represents another potential source of TACs. Industrial businesses in this area represent a potential source of TACs that could pose health risks to residents living in the southern portions of the CSP.

Mitigation Measures AQ-2. Prior to approving construction of industrial areas south of CSP, a screening health risk assessment (HRA) shall be conducted. If that screening HRA shows potential health risks to CSP residents, than a more detailed HRA shall be conducted. If significance acute, chronic, or carcinogenic health risks are predicted, then the proposed industries shall be required to reduce emissions so that health risks are reduced to levels considered to be less than significant.

Odors

Land use conflicts could generate objectionable odors. For the proposed project, objectionable odors typically occur when a land use with sensitive receptors is located in close proximity and downwind from an odor source, or when an odor source is located upwind of a sensitive receptor. Examples of sensitive receptors include land uses that include residences, hospitals, schools, and daycare centers. Odor sources typically include wastewater treatment plants, rendering plants, landfills, and large industrial facilities.

There are currently few sensitive receptors present within the immediate project vicinity that would have the potential to be exposed to objectionable odors emitted during project construction. As the proposed project moves forward in building out, sensitive receptors would begin to locate on the project site, including the elementary school and residences. These new sensitive receptors may potentially be exposed to objectionable odors emitted during project construction. Potential sources that may emit odors during construction activities include the use of architectural coatings and solvents. However, these would be short-term, minor odor impacts.

Land uses and industrial operations associated with odor complaints include agricultural uses, wastewater treatment plants, food processing

plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project site is currently used for agricultural and grazing purposes. Odors from these existing activities would be eliminated by buildout of the CSP.

The proposed project is located near the Pleasant Grove WWTP, which may emit odors that could affect sensitive receptors within the project area. Sensitive receptors primarily include residences that could be located within the CSP commercial mixed use area and the high density residential areas located just northwest of the Blue Oaks Boulevard/West Side Drive intersection. With normal operation and the use of chlorine, odors associated with the Pleasant Grove WWTP would be minimal.

Although all CSP residences would be more than 1,000 feet from the WWTP, they could be subject to a nuisance level of odors during times of process upsets at the WWTP. However, these process upsets occur rarely and, therefore, odor impacts would not be significant. Although odor impacts are considered to be less than significant, potential residents should be alerted to the proximity of the Pleasant Grove WWTP by requiring deed notifications. This would apply to all residential units located south of Parkway One within the CSP area.

Greenhouse Gas Emissions

The project site is undeveloped and has historically been used for agricultural or grazing activities. Consequently, existing GHG emissions on the project site are negligible.

Table 13 shows GHG emissions at full buildout of the proposed CSP project in 2025. Transportation represents the largest percentage of CSP GHG emissions, followed by natural gas and electricity emissions.

Alternative 1 – No Project

GHG emissions associated with Alternative 1 would be negligible because no development would occur under this alternative.

Alternative 2 – Reduced Density/Same Footprint

Table 14 shows GHG emissions at full buildout in 2025 for Alternative 2 without and with the Urban Reserve. GHG emissions associated with Alternative 2 would be slightly lower than those for the Proposed Project because of the lower vehicle miles traveled and the higher ratio of higher density residential development as compared to the Proposed Project.

Table 13. Operational GHG Emissions for Specific Plan Buildout (unmitigated, metric tons per year)

Proposed Specific Plan Buildout (2025)	CO ₂ e	% of Total
Transportation	29,091.87	74.99%
Area Source	23.55	0.06%
Electricity	4,789.64	12.35%
Natural Gas	4,852.44	12.51%
Water & Wastewater	313.53	0.81%
Solid Waste	-275.89	-0.71%
Total	38,795.14	100.00%

Proposed Specific Plan Buildout with Urban Reserve (2025)	CO ₂ e	% of Total
Transportation	31,032.16	73.88%
Area Sources	26.94	0.06%
Electricity	5,348.96	12.74%
Natural Gas	5,576.62	13.28%
Water and Wastewater	345.94	0.82%
Solid Waste	-329.17	-0.78%
Total	42,001.46	100.00%

Notes: Detailed calculations included in the Appendix A. Transportation emissions estimated using URBEMIS2007 and several inputs from the traffic analysis, including vehicle trip generation rates and vehicle miles traveled (DKS, 2010). URBEMIS CO₂ model results converted to metric tons per year and to CO₂ equivalent emissions using factors showing 5% of transportation emissions are from CH₄, N₂O, and HFCs (U.S. EPA 2005). Area sources include hearth emissions and landscape maintenance equipment emissions. Natural gas, direct electricity, and indirect (water-related) electricity estimates based on land uses for the project and on average fuel use for those land uses (KEMA-XENERGY, Itron, and RoperASW. 2004; Itron, Inc. 2006). Water use based on water reports prepared specifically for this project (MacKay & Somps, 2010; HydroScience Engineers, Inc. 2010). Electricity estimates based on emission factors developed by CAPCOA (2010) and the Climate Action Registry (2009). Waste generation based on information provided by City of Roseville (McKinney, pers. comm.).

Table 14. Operational GHG Emissions for Alternative 2 Buildout (unmitigated, metric tons per year)

Alternative 2 Buildout	CO ₂ e	% of Total
Transportation	23,245.43	76.11%
Area Sources	17.02	0.06%
Electricity	3,741.89	12.25%
Natural Gas	3,512.64	11.50%
Water and Wastewater	219.47	0.72%
Solid Waste	-193.12	-0.63%
Total	30,543.34	100.00%

Alternative 2 Buildout Plus Urban Reserve	CO ₂ e	% of Total
Transportation	25,212.94	74.65%
Area Sources	20.43	0.06%
Electricity	4,301.21	12.73%
Natural Gas	4,236.82	12.54%
Water and Wastewater	251.88	0.75%
Solid Waste	-246.40	-0.73%
Total	33,776.89	100.00%

Notes: Detailed calculations in Appendix A. Additional information also found in notes of Table 13.

Alternative 3 – High Density/Compact Development

Table 15 shows GHG emissions at full buildout for Alternative 3 in 2025 and for Alternative 3 plus Urban Reserve in 2025. GHG emissions associated with Alternative 3 would be lower than those for the Proposed Project because of the lower trip generation and vehicle miles traveled.

Table 15. Operational GHG Emissions for Alternative 3 Buildout (unmitigated, metric tons per year)

Alternative 3 Buildout	CO ₂ e	% of Total
Transportation	26,857.44	76.70%
Area Sources	18.82	0.05%
Electricity	4,094.87	11.69%
Natural Gas	4,006.24	11.44%
Water and Wastewater	313.53	0.90%
Solid Waste	-275.89	-0.79%
Total	35,015.02	100.00%

Alternative 3 Buildout Plus Urban Reserve	CO ₂ e	% of Total
Transportation	28,679.86	75.27%
Area Sources	22.23	0.06%
Electricity	4,654.19	12.21%
Natural Gas	4,730.43	12.41%
Water and Wastewater	345.94	0.91%
Solid Waste	-329.17	-0.86%
Total	38,103.49	100.00%

Notes: Detailed calculations in Appendix A. Additional information also found in notes of Table 13.

The following measures will reduce emissions of GHG.

Mitigation Measure GHG - 1. Prioritized parking within new commercial and retail areas shall be given to electric vehicles, hybrid vehicles, and alternative fuel vehicles.

Mitigation Measure GHG – 2. All new homes and non-residential buildings developed in the CSP area shall, at a minimum, comply with a least one of the following:

Design and construct building(s) to be capable of being certified under the Leadership in Energy and Environmental Design (LEED) or another building rating system that achieves a comparable level of GHG reduction such as the Build-it Green program, or ENERGY STAR program. However, no formal certification shall be required, and the City Manager or his/her designee shall make the determination that the potential for certification has been achieved. All credits used to demonstrate capability to meet one of the above certifications must directly or indirectly result in a reduction in GHG emissions. These measures will reduce electricity use by a minimum of 20% and natural gas use by a minimum of 20%.

Mitigation Measure GHG - 3. New development or major rehabilitation of commercial, office, or industrial development (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) must incorporate renewable energy generation (on- or off-site) to provide 15 percent or more of the project's energy needs.

Mitigation Measure GHG - 4. CSP shall require that the design or purchase of any new street lights and water and wastewater pumps and treatment systems achieve a 10 percent reduction beyond an estimated baseline energy use for this infrastructure. All new traffic lights installed within CSP shall use LED technology.

Mitigation Measure GHG - 5. CSP shall require all new development or major rehabilitation (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) projects to recycle and/or salvage at least 50 percent of nonhazardous construction and demolition debris. To implement this requirement, a construction waste management plan identifying materials to be diverted from disposal and whether the materials will be stored on-site or commingled shall be developed and implemented by the applicant for said development or rehabilitation. Excavated soil and land-clearing debris do not contribute to this credit. Calculation can be done by weight or volume but must be consistent throughout.

Mitigation Measure GHG - 6. CSP shall require all new development and major rehabilitation (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) projects to incorporate any combination of the following strategies to reduce heat gain for 50 percent of the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways):

- Shaded (Within 5 years of occupancy)
- Paving materials with a Solar Reflective Index (SRI) of at least 29
- Open grid pavement system (pavement that is less than 50% impervious and contains vegetation in the open cells)
- Parking spaces under cover (defined as underground, under deck, under roof, or under building.) Any roof used to shade or cover parking must have an SRI of at least 29.

Mitigation Measure GHG - 7. CSP shall require that all new development and major rehabilitation (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) projects incorporate "green building" points in construction plans prior to issuing a permit to build. Such points may be achieved through checklists identified by New Home Construction Green Building Guidelines available at www.builditgreen.org, or through a similar list that

distinguishes specific measures targeting efficiencies in energy, resource use, or other measures that would also directly or indirectly result in GHG emission reductions. Specific efficiencies that would reduce GHG emissions shall be implemented where feasible for all project areas including site design, landscaping, foundation, structural frame and building envelope, exterior finishing, plumbing, appliance use, insulation, heating, venting and air conditioning, building performance, use of renewable energy, finishes, and flooring.

Implementation of the mitigation measures described above would reduce emissions from the CSP to the levels shown in Table 16. The mitigated emission estimates shown in Table 16 also assume a 7.2% emission reduction associated with implementation of the California Air Resources Board’s Low Carbon Fuels Standard, and a 19.6% reduction associated with the Pavley Standards.

Table 16. Operational GHG Emissions for CSP Specific Plan Buildout (mitigated, metric tons per year)

Proposed Specific Plan Buildout (2025)	CO ₂ e	% of Total
Transportation	21,716.18	73.64%
Area Source	23.55	0.08%
Electricity	3,831.72	12.99%
Natural Gas	3,881.95	13.16%
Water & Wastewater	313.53	1.06%
Solid Waste	-275.89	-0.94%
Total	29,491.03	100.00%

Proposed Specific Plan Buildout with Urban Reserve (2025)	CO ₂ e	% of Total
Transportation	23,164.54	72.51%
Area Sources	26.94	0.08%
Electricity	4,279.17	13.39%
Natural Gas	4,461.29	13.96%
Water and Wastewater	345.94	1.08%
Solid Waste	-329.17	-1.03%
Total	31,948.73	100.00%

Notes: Mitigated emissions include the following assumptions. Mitigated transportation assumes incorporation of ARB’s Low Carbon Fuels Standard, which reduces CO₂e by 7.2 percent, and ARB’s Pavley Rule, which reduces CO₂e by 19.6 percent. Electricity and natural gas mitigation assume a 20 percent reduction in associated CO₂e emissions through the combined use of the mitigation measures described in this report.

Table 17 shows mitigated GHG emissions for buildout of Alternative 2 without and with Urban Reserve. The mitigated emissions shown for Alternative 2 assume the same level of mitigation as for the Proposed Project.

Table 17. Operational GHG Emissions for Alternative 2 (mitigated, metric tons per year)

Alternative 2 without Urban Reserve (2025)		
	CO ₂ e	% of Total
Transportation	17,351.99	74.80%
Area Sources	17.02	0.07%
Electricity	2,993.52	12.90%
Natural Gas	2,810.11	12.11%
Water and Wastewater	219.47	0.95%
Solid Waste	-193.12	-0.83%
Total	23,198.99	100.00%

Alternative 2 with Urban Reserve (2025)		
	CO ₂ e	
Transportation	18,820.68	73.30%
Area Sources	20.43	0.08%
Electricity	3,440.97	13.40%
Natural Gas	3,389.46	13.20%
Water and Wastewater	251.88	0.98%
Solid Waste	-246.40	-0.96%
Total	25,677.02	100.00%

Notes: Mitigated emissions include the following assumptions. Mitigated transportation assumes incorporation of ARB's Low Carbon Fuels Standard, which reduces CO₂e by 7.2 percent, and ARB's Pavley Rule, which reduces CO₂e by 19.6 percent. Electricity and natural gas mitigation assume a 20 percent reduction in associated CO₂e emissions through the combined use of the mitigation measures described in this report.

Table 18 shows mitigated GHG emissions for Alternative 2 without and with the Urban Reserve. The mitigated emissions shown for Alternative 2 assume the same level of mitigation as in the Proposed Project and Alternative 1.

Table 18. Operational GHG Emissions for Alternative 3 (mitigated, metric tons per year)

Alternative 3 without Urban Reserve (2025)	CO ₂ e	% of Total
Transportation	20,048.24	75.41%
Area Sources	18.82	0.07%
Electricity	3,275.90	12.32%
Natural Gas	3,205.00	12.06%
Water and Wastewater	313.53	1.18%
Solid Waste	-275.89	-1.04%
Total	26,585.60	100.00%

Alternative 3 with Urban Reserve (2025)	CO ₂ e	% of Total
Transportation	21,408.63	73.94%
Area Sources	22.23	0.08%
Electricity	3,723.35	12.86%
Natural Gas	3,784.34	13.07%
Water and Wastewater	345.94	1.19%
Solid Waste	-329.17	-1.14%
Total	28,955.33	100.00%

Notes: Mitigated emissions include the following assumptions. Mitigated transportation assumes incorporation of ARB's Low Carbon Fuels Standard, which reduces CO₂e by 7.2 percent, and ARB's Pavley Rule, which reduces CO₂e by 19.6 percent. Electricity and natural gas mitigation assume a 20 percent reduction in associated CO₂e emissions through the combined use of the mitigation measures described in this report.

The mitigation measures specified above for the CSP and each alternative are based on measures recommended by the California Attorney General (California Department of Justice, 2010) and by the California Air Pollution Control Officers Association (2008, 2009, and 2010). These measures, when combined with the Low Carbon Fuels Standard, and Pavley Regulation, reduce GHG emissions by 24 percent as compared to unmitigated levels.

References

California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA and Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. January. Available:

<http://www.capcoa.org/ceqa/CAPCOA%20White%20Paper%20-%20CEQA%20and%20Climate%20Change.pdf>

California Air Pollution Control Officers Association (CAPCOA). 2009. Model Policies for Greenhouse Gases in General Plans, A Resource for Local Governments to Incorporate General Plan Policies to Reduce Greenhouse Gas Emissions. June.

<http://www.capcoa.org/modelpolicies/CAPCOA%20Model%20Policies%20for%20Greenhouse%20Gases%20in%20General%20Plans%20-%20June%202009.pdf>

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures. August.

California Air Resources Board. 2005. Air Quality and Land Use Handbook: A Community Health Perspective. Sacramento, CA.

California Air Resources Board. 2006. EMFAC2007 Emissions Model and Users Guide. Available:

<http://www.arb.ca.gov/msei/offroad/offroad.htm>

California Air Resources Board. 2008. Climate Change Scoping Plan, A Framework for Change. December.

California Air Resources Board. 2010a. Ambient air quality standards.

Available : <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>

California Air Resources Board 2010b. Area Designation Maps/State and National. Available: <http://www.arb.ca.gov/desig/adm/adm.htm>.

California Air Resources Board. 2010c. Air Quality Data Statistics Monitoring data. Available: <http://www.arb.ca.gov/adam>.

California Climate Action Registry. 2009. General Reporting Protocol, Reporting Entity Wide Greenhouse Gas Emissions. Version 3.1, January 2009. Los Angeles, CA. Available :

http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf.

California Department of Justice. 2010. California Environmental Quality Act – Global Warming. Available:
<http://ag.ca.gov/globalwarming/ceqa/GHGmitigation.php>

California Energy Commission. 2005. Global Climate Change: In Support of the 2005 Integrated Energy Policy Report. (CEC-600-2005-007). June. Available: <http://www.energy.ca.gov/2005publications/CEC-600-2005-007/CEC-600-2005-007-SF.PDF>

California Energy Commission. 2004. Roseville Energy Park Application for Certification (03-AFC-1) Placer County, Staff Report. November (03-AFC-1). Sacramento, CA.

California Environmental Protection Agency. 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature. Sacramento, CA. March. Available:
http://www.climatechange.ca.gov/climate_action_team/reports/2006-04-03_FINAL_CAT_REPORT.PDF

DKS Associates, Inc. 2010. Traffic Impact Analysis for the Creekview Specific Plan. Roseville, CA.

Garza, V.J., Graney, P. and Sperling, D. 1997. Transportation Project-Level Carbon Monoxide Protocol. Revised December, 1997. University of California, Davis. Prepared for Environmental Program California Department of Transportation. Available:
<http://www.dot.ca.gov/hq/env/air/pages/coprot.htm>

HydroScience Engineers, Inc. 2010. Creekview Specific Plan Water Conservation Plan. September 7. Berkeley, CA.

Intergovernmental Panel on Climate Change. 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Agriculture, Forestry, and Other Land Use Emissions from Livestock and Manure Management. Prepared by the National Greenhouse Gas Inventories Programme, S. Eggleston, L. Buendia, K. Miwa, T. Ngara, K. Tanabe (eds.). Institute for Global Environmental Strategies, Hayama, Japan. Available: <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.htm>.

Itron, Inc. 2006. California Commercial End-Use Survey. Available:
<http://capabilities.itron.com/CeusWeb/Default.aspx>.

KEMA-XENERGY, Itron, and RoperASW. 2004. California Statewide Residential Appliance Saturation Study. Volume 2, Study Results Final Report. Prepared for California Energy Commission, June 2004. 300-00-004. Available: http://www.energy.ca.gov/reports/400-04-009/2004-08-17_400-04-009VOL2B.PDF.

MacKay & Somps. 2010. Creekview Specific Plan Final Draft Master Water Study. Prepared for Granite Bay Development. September 7.

Navigant Consulting. 2006. Refining Estimates of Water Related Energy Use in California. Prepared for the California Energy Commission. Sacramento, CA. (Report No. CEC-500-2006-118).

U.S. EPA. 2005. Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. www.epa.gov/OMS/climate/420f05004.htm Accessed: September 17, 2010.

U.S. EPA. 2010a. AirData. Last Revised: September 15, 2010. Available: <http://www.epa.gov/oar/data/geosel.html>. Accessed: September 15, 2010.

U.S. EPA 2010b. WASTE Reduction Model (WARM), (Step 5: View Emission/Energy Factors). Updated, August 2010. Available at: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_Form.html

U.S. Green Building Council. 2007. New Construction and Major Renovation Version 2.2. Reference Guide. Third Edition, October. Washington, D.C.

Western Sanitary Regional Landfill. 2010. Website location: <http://www.wpwma.com/landfill.html>. Accessed September 17, 2010.

Personal Communication

McKinney, Kelye. City of Roseville, CA – September 8, 2010 e-mail to Tim Rimpo – Rimpo and Associates, and Kathy Pease – City of Roseville, regarding Creekview waste generation.

Chang, Yu-Shuo. Placer County Air Pollution Control District, Auburn, California – September 13, 2010 phone conversation with Tim Rimpo – Rimpo and Associates, regarding PCAPCD's significance thresholds.